

## WHAT IS CLAIMED IS:

1. A light emitting device causing emission output of a light having a pseudo-continuous spectrum obtained by synthesizing a plurality of emissions differing in peak wavelength so as to ensure an effective wavelength region showing an emission intensity of 5% or more of a reference intensity over a wavelength region of 50 nm or more, the reference intensity being defined as an emission intensity at a peak wavelength in the synthesized spectrum.

2. The light emitting device as claimed in Claim 1, wherein the light having a pseudo-continuous spectrum is visible light, and the effective wavelength region is ensured over a wavelength region of 50 nm or more in the visible wavelength region.

3. The light emitting device as claimed in Claim 1 having a double hetero light emitting layer portion composed of compound semiconductors, the double hetero light emitting layer portion having an active layer comprising a plurality of emission unit layers differing from each other in band gap energy, and the emission output of the light having a pseudo-continuous spectrum is ascribable to a combination of light emission from the individual emission unit layers.

4. The light emitting device as claimed in Claim 2 having a double hetero light emitting layer portion composed of compound semiconductors, the double hetero light emitting layer portion having an active layer comprising a plurality of emission unit  
5 layers differing from each other in band gap energy, and the emission output of the light having a pseudo-continuous spectrum is ascribable to a combination of light emission from the individual emission unit layers.

10 5. The light emitting device as claimed in Claim 3, wherein the emission unit layers comprise well layers each of which is sandwiched by two barrier layers.

6. The light emitting device as claimed in Claim 4, wherein  
15 the emission unit layers comprise well layers each of which is sandwiched by two barrier layers.

7. The light emitting device as claimed in Claim 5, wherein emission intensity of the emission unit layer is adjusted based on  
20 thickness and/or the number of the well layers.

8. The light emitting device as claimed in Claim 6, wherein emission intensity of the emission unit layer is adjusted based on thickness and/or the number of the well layers.

9. The light emitting device as claimed in Claim 7, wherein the well layers, which contribute to a wavelength region where a larger emission intensity is attained in the pseudo-continuous spectrum, are disposed in a larger thickness and/or the number of  
5 layers.

10. The light emitting device as claimed in Claim 8, wherein the well layers, which contribute to a wavelength region where a larger emission intensity is attained in the pseudo-  
10 continuous spectrum, are disposed in a larger thickness and/or the number of layers.

11. The light emitting device as claimed in Claim 5, wherein the well layers have a smaller depth of well in the emission unit  
15 layer causative of a shorter emission wavelength.

12. The light emitting device as claimed in Claim 6, wherein the well layers have a smaller depth of well in the emission unit layer causative of a shorter emission wavelength.  
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13. The light emitting device as claimed in Claim 5, wherein the well emission unit layer has a quantum well structure.

14. The light emitting device as claimed in Claim 6,  
25 wherein the well emission unit layer has a quantum well structure.

15. The light emitting device as claimed in Claim 13,  
wherein the emission intensity of the emission unit layer having  
the quantum well structure is adjusted by the number of layers of  
5 the well layers.

16. The light emitting device as claimed in Claim 14,  
wherein the emission intensity of the emission unit layer having  
the quantum well structure is adjusted by the number of layers of  
10 the well layers.

17. The light emitting device as claimed in Claim 13,  
wherein the well layers have a smaller thickness in the emission  
unit layer causative of a shorter emission wavelength.  
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18. The light emitting device as claimed in Claim 14,  
wherein the well layers have a smaller thickness in the emission  
unit layer causative of a shorter emission wavelength.

20 19. The light emitting device as claimed in Claim 3,  
wherein the double hetero light emitting layer portion is designed  
so that the main surface thereof on one side of the stacking  
direction serves as a light extraction surface, and so that the  
emission unit layer in the repetitive unit causative of longer  
25 emission wavelength is disposed more further from the light

extraction surface in the thickness-wise direction of the active layer.

20. The light emitting device as claimed in Claim 4,  
5 wherein the double hetero light emitting layer portion is designed so that the main surface thereof on one side of the stacking direction serves as a light extraction surface, and so that the emission unit layer in the repetitive unit causative of longer  
10 emission wavelength is disposed more further from the light extraction surface in the thickness-wise direction of the active layer.

21. The light emitting device as claimed in Claim 3,  
wherein a plurality of repetitive units, each of which being  
15 assumed as comprising a plurality of the emission unit layers differing from each other in the emission wavelength, are formed in a plural number in the thickness-wise direction of the active layer.

20 22. The light emitting device as claimed in Claim 4, wherein a plurality of repetitive units, each of which being assumed as comprising a plurality of the emission unit layers differing from each other in the emission wavelength, are formed in a plural number in the thickness-wise direction of the active  
25 layer.

23. The light emitting device as claimed in Claim 21, wherein the double hetero light emitting layer portion is designed so that the main surface thereof on one side of the stacking direction serves as a light extraction surface, and so that the emission unit layer causative of a longer emission wavelength in each of the repetitive unit is disposed more further from the light extraction surface in the thickness-wise direction of the active layer.

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24. The light emitting device as claimed in Claim 22, wherein the double hetero light emitting layer portion is designed so that the main surface thereof on one side of the stacking direction serves as a light extraction surface, and so that the emission unit layer causative of a longer emission wavelength in each of the repetitive unit is disposed more further from the light extraction surface in the thickness-wise direction of the active layer.

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25. The light emitting device as claimed in Claim 3, wherein the plurality of emission unit layers are aligned according to an order of magnitude of the band gap energy such as ensuring a difference of 0.42 eV or less between every adjacent band gap energies.

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26. The light emitting device as claimed in Claim 4,  
wherein the plurality of emission unit layers are aligned according  
to an order of magnitude of the band gap energy such as ensuring  
a difference of 0.42 eV or less between every adjacent band gap  
5 energies.

27. The light emitting device as claimed in Claim 25,  
wherein the effective wavelength region of the pseudo-continuous  
spectrum is synthesized by four or more emission unit layers  
10 differing in emission wavelength from each other.

28. The light emitting device as claimed in Claim 26,  
wherein the effective wavelength region of the pseudo-continuous  
spectrum is synthesized by four or more emission unit layers  
15 differing in emission wavelength from each other.

29. The light emitting device as claimed in Claim 27,  
wherein the pseudo-continuous spectrum has a ripple ratio of 0.1  
or less over the entire portion of the effective wavelength region.

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30. The light emitting device as claimed in Claim 28,  
wherein the pseudo-continuous spectrum has a ripple ratio of 0.1  
or less over the entire portion of the effective wavelength region.

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31. The light emitting device as claimed in Claim 1,

wherein the pseudo-continuous spectrum is obtained as a broad continuous spectrum having only a single peak over the effective wavelength region, or such as having a monotonously increasing or decreasing intensity along with the wavelength over the effective wavelength region.

32. The light emitting device as claimed in Claim 2, wherein the pseudo-continuous spectrum is obtained as a broad continuous spectrum having only a single peak over the effective wavelength region, or such as having a monotonously increasing or decreasing intensity along with the wavelength over the effective wavelength region.

33. The light emitting device as claimed in Claim 3, wherein the double hetero light emitting layer portion is composed of  $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$  (where,  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$ ), and the effective wavelength region is ensured within a wavelength region from 550 nm to 670 nm, both ends inclusive.

34. The light emitting device as claimed in Claim 4, wherein the double hetero light emitting layer portion is composed of  $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$  (where,  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$ ), and the effective wavelength region is ensured within a wavelength region from 550 nm to 670 nm, both ends inclusive.



35. The light emitting device as claimed in Claim 1, wherein an intensity distribution of the pseudo-continuous spectrum is determined so that a predetermined wavelength region within the effective wavelength region of the pseudo-continuous spectrum is designed as a color rendering wavelength region in which color rendering properties for a color tone corresponded to the predetermined wavelength region is selectively enhanced as compared with the color rendering properties for other color tones corresponded to other wavelength regions.

36. The light emitting device as claimed in Claim 2, wherein an intensity distribution of the pseudo-continuous spectrum is determined so that a predetermined wavelength region within the effective wavelength region of the pseudo-continuous spectrum is designed as a color rendering wavelength region in which color rendering properties for a color tone corresponded to the predetermined wavelength region is selectively enhanced as compared with the color rendering properties for other color tones corresponded to other wavelength regions.

37. The light emitting device as claimed in Claim 35, wherein the emission intensity of the emission unit layer ascribable to the color rendering wavelength region is set higher

than the emission intensity of other emission unit layers ascribable to other wavelength regions.

38. The light emitting device as claimed in Claim 36,  
5 wherein the emission intensity of the emission unit layer ascribable to the color rendering wavelength region is set higher than the emission intensity of other emission unit layers ascribable to other wavelength regions.

10 39. The light emitting device as claimed in Claim 3 having a first device and a second device as combined therein, both devices respectively having a double hetero light emitting layer portion composed of compound semiconductors, the first device having an emission wavelength of an emission unit layer  
15 contained in an active layer in the double hetero light emitting layer portion of 520 nm to 700 nm, both ends inclusive, and the second device of which having the same of 350 nm to 560 nm, both ends inclusive, and at least either of the first device and second device includes a plurality of the emission unit layers in  
20 the active layer.

40. The light emitting device as claimed in Claim 4 having a first device and a second device as combined therein, both devices respectively having a double hetero light emitting layer  
25 portion composed of compound semiconductors, the first device

having an emission wavelength of an emission unit layer contained in an active layer in the double hetero light emitting layer portion of 520 nm to 700 nm, both ends inclusive, and the second device of which having the same of 350 nm to 560 nm, both ends inclusive, and at least either of the first device and second device includes a plurality of the emission unit layers in the active layer.

41. The light emitting device as claimed in Claim 39, wherein the double hetero light emitting layer of the first device is composed of  $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$  (where,  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$ ), and the double hetero light emitting layer of the second device is composed of  $\text{In}_a\text{Ga}_b\text{Al}_{1-a-b}\text{N}$  (where,  $0 \leq a \leq 1$ ,  $0 \leq b \leq 1$  and  $a+b \leq 1$ ).

42. The light emitting device as claimed in Claim 40, wherein the double hetero light emitting layer of the first device is composed of  $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$  (where,  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$ ), and the double hetero light emitting layer of the second device is composed of  $\text{In}_a\text{Ga}_b\text{Al}_{1-a-b}\text{N}$  (where,  $0 \leq a \leq 1$ ,  $0 \leq b \leq 1$  and  $a+b \leq 1$ ).

43. The light emitting device as claimed in Claim 1, wherein the pseudo-continuous spectrum contains no infrared emission components having a wavelength of 710 nm or longer.

44. The light emitting device as claimed in Claim 2,

wherein the pseudo-continuous spectrum contains no infrared emission components having a wavelength of 710 nm or longer.

45. The light emitting device as claimed in Claim 1,  
5 wherein the pseudo-continuous spectrum contains no ultraviolet emission components having a wavelength of 350 nm or shorter.

46. The light emitting device as claimed in Claim 2,  
wherein the pseudo-continuous spectrum contains no ultraviolet  
10 emission components having a wavelength of 350 nm or shorter.

47. A lighting apparatus comprising the light emitting device as claimed in Claim 1 and a power supply portion for supplying emission drive power to the light emitting device, and  
15 configured so as to extract visible light from the light emitting device as an illumination light.

48. The lighting apparatus as claimed in Claim 47, wherein the power supply portion has a voltage conversion portion for  
20 converting output voltage from a power source portion into light emitting device drive voltage.

49. The lighting apparatus as claimed in Claim 48, configured so that a drive voltage output terminal for outputting  
25 the light emitting device drive voltage is provided to the voltage

conversion portion, and so that a light source module, having integrated therein the light emitting device and an incoming terminal, is connected to the drive voltage output terminal through the incoming terminal in a detachable manner.

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50. The lighting apparatus as claimed in Claim 48, wherein the power supply portion is a commercial AC power source, and the voltage conversion portion is an AC/DC converter for converting output voltage of the commercial AC power source into  
10 DC voltage.

51. The lighting apparatus as claimed in Claim 50, wherein the voltage conversion portion is attached to a light bulb socket directly connected to the commercial AC power source, through  
15 an attachment conductor portion compatible with the light bulb socket in a detachable manner.

52. The lighting apparatus as claimed in Claim 51, wherein the voltage conversion portion and the light emitting device are  
20 inseparably bonded to thereby configure a light source unit with voltage conversion function.